{DRAFT}

Engineering Evaluation
GeoRestoration, Inc.; Plant Number 16467
Application Number 10858

Background

Georestoration, Inc. (GI) is applying for an AC/PO for Portable Equipment consisting of a Soil Vapor Extraction Unit. Soil vapor extraction (SVE) will be accomplished by means of a regenerative vacuum blower (S-1) with a maximum operating capacity of 350 scfm. Vapor abatement is provided by an electrically fired Catalytic Oxidizer (Cat-Ox). In accordance with Regulation 2-1-413, the District may issue "a single portable permit which will allow the source to operate anywhere in the District, provided the APCO approves the permit, and the source meets the definition of portable equipment set forth in Section 2-1-220." Operating conditions will be worded to ensure that the requirements, and any expressed emission limits of that section are satisfied, through proper notification, source testing, and recordkeeping practices. GI had initially applied for a single-site permit, because the site (901 Emory Street, San Jose) is located within 1,000 feet of a School. However, GI subsequently secured contracts to perform remediation activities at a second site (795 Stockton Avenue, San Jose) also within 1,000 feet of the same school (Bellarmine College Preparatory School). GI then requested that the application be changed to that for a portable SVE system, and that the District conduct a single Public Notification process for both locations. This is allowed under Regulation 2-1-220.4 since a public notification process will be undertaken as part of this application process. Operating conditions will allow for operation at these two locations, but any other operation within 1,000 feet of a school site will trigger another notification process and subsequent application process. The Cat-Ox will be equipped with continuous temperature monitoring to ensure that BACT destruction efficiencies are met. Emission monitoring for operation of the equipment will be conducted according to established Source Test methodology. Procedures are outlined in the conditions found below.

For the first two mobilizations, this source will be located within 1,000 feet of the outer boundary of Bellarmine College Preparatory and as such, this application requires Public Notification via Reg. 2-1-412. No other schools are within ¼ mile of the source. A Public Notice was prepared and sent out to the home address of the students of the school and to each address within a radius of 1,000 feet of the source. This Evaluation Report was posted on the District Webpage along with the Public Notice. A phone line was set-up at the district to receive public comments and none were received.

Attached to this report is a copy of the Public Notice. The total cost of the Public Notification amounted to $?,???.00. This amount exceeded the $2,000.00 Public Notice fee. All fees including the standard AC/PO fees of $?,???.00 have been paid.

Emission Calculations

For a conservative estimate of yearly emissions, we shall assume that the system is operated for an entire year with an inlet concentration corresponding to the initial soil vapor concentration level. Generalized assumptions follow:

* Operating conditions: Pressure = 1 Atm; Inlet Temperature = 21^{O}C; 1 mole occupies 24.15 l.

* Molecular weight of TPHg = 100 g/mole (value for "weathered gasoline"). Molecular weight of Benzene = 87 g/mole.

* Influent values based on operational parameters of equipment and applicant supplied soil vapor test results: influent rate = 350 scfm throughout; maximum influent concentration = 3,000 ppmv VOC, 60 ppmv Benzene; destruction efficiency = 98.5% throughout.

Emissions of Precursor Organics:

$$3{,}000E\text{-}6 * \frac{350\ ft^3}{min} * \frac{1440\ min}{1\ day} * \frac{28.32\ l}{1\ ft^3} * \frac{1\ mole}{24.15\ l} * \frac{100\ g}{mole} * \frac{1\ \#}{454\ g} * (1 - 0.985) = \textbf{5.86 \#/day} \text{ (abated)}$$

Highest Daily Emissions	**=**	**5.86 #/day**
Annual Average	**=**	**5.86 #/day**
RFP	**=**	**1.07 t/yr**

Emissions of Toxic Air Contaminants {benzene}:

$$60\ E\text{-}6 * \frac{350\ ft^3}{min} * \frac{1440\ min}{1\ day} * \frac{28.32\ l}{1\ ft^3} * \frac{1\ mole}{24.15\ l} * \frac{78\ g}{mole} * \frac{1\ \#}{454\ g} * (1 - 0.985) = \textbf{9.1E-2 \#/day} \text{ (abated)}$$

Toxics

Two Toxic Risk Screens were performed for this application to determine the risk to the maximally exposed industrial and residential receptors at both locations. The ISCST3 air dispersion model was used to estimate the pollutant concentrations in the area surrounding the site for a unit emission rate. By applying unit risk factors (taken from CAPCOA guidelines), a linear relationship between emissions and risk was established. It was determined that an emission rate of 0.10 pounds per day corresponded to a risk of 5.1 in a million to the maximally exposed receptor at the 901 Emory Street location. This emission rate would result in a maximum risk of 0.026 in a million to the maximally exposed Bellarmine College Preparatory receptor. This emission rate corresponded to a risk of 1.34 in a million to the maximally exposed receptor at the 795 Stockton Avenue location (0.22 in a million to the maximally exposed School receptor). In accordance with the Toxic Section Risk Management Policy, the impact is then insignificant since this risk is no more than 10 in a million; therefore, the Toxics Section has recommended the issuing of this P/O with a benzene emission limit of **0.10 #/day**. To ensure that subsequent operation of the portable equipment in a new (unknown) location does not result in an unacceptable risk, permit conditions will require that annual emissions or Benzene do not exceed the Toxic Trigger level of 6.4 pounds.

New Source Review

This proposed project will not emit over 10 lbs per highest day and is therefore not required to implement BACT; however, it will be achieved in practice. Furthermore, TBACT is required and is equivalent to BACT. For Soil Vapor Extraction operations, BACT is defined as attainment of set destruction efficiencies corresponding to set influent concentration values. Operation of the catalytic oxidizer will be conditioned to ensure attainment of the following required destruction efficiencies: $\geq$98.5% if inlet POC $\geq$2000; $\geq$97% if inlet POC <2000 to $\geq$200 ppmv; $\geq$90% if inlet POC <200 ppmv. Offsets need not be imposed as annual emissions will not exceed 10 tons.

CEQA

The project is considered to be ministerial under the Districts proposed CEQA Regulation 2-1-311 and therefore is not subject to CEQA review. The engineering review for this project requires only the application of standard permit conditions and standard emission factors and therefore is not discretionary as defined by CEQA.

Compliance

Based on the information submitted, this operation is expected to be in compliance with Regulation 8-47-301, Emission Control Requirements, Specific compounds, and 8-47-302, Organic compounds. The POC emissions will be vented through a Catalytic Oxidizer at all times of operation. Operating conditions have been worded to ensure that the equipment meets the criteria regarding portability as per Regulation 2-1-220. Criteria pollutants are

not expected to exceed 10 tons per year, and emissions of toxic substances shall be below the trigger levels found in Table 2-1-316.The application triggered Public Notification as required by Regulation 2-1-412. Public Notification was performed by the District and GI was invoiced for the services required. Fees in the amount of $?,???.00 (including the standard A/C and P/O fees) have been paid in full.

Recommendation

Recommend that an Authority to Construct be issued for source:

S-1: Portable Dual Phase Extraction System consisting of a 350 max scfm vacuum blower, and ancillary equipment, abated by A-1, Electrically fired Catalytic Oxidizer.

Conditions

1. The operator of this source shall provide written notification to the Permit Services Division at least 3 days prior to start-up of operation at any new location. The notification shall include:

   a. Application Number (10858) and Plant Number (16467).
   b. Street address, including zip code, for the location where the equipment will be operated.
   c. The name and telephone number of a contact person where the equipment will be operated.
   d. The date of initial start-up and estimated duration of operations at that location.
   e. The distance from the source to the outer boundary of the nearest K-12 school, or indication that the distance is greater than 1500 feet.

   In the event that the start-up is delayed less than 5 days, the operator may provide telephone notice of said change to the assigned Plant Engineer in the Permit Services Division. If the start-up is delayed more than 5 days, written notification must be resubmitted.

2. This equipment shall not remain at any single location for a period in excess of 12 consecutive months, following the date of initial operation except as allowed under Section 2-1-220.10. If this portable equipment remains at any fixed location for more than 12 months, the portable permit will automatically revert to a conventional permanent location permit and will lose its portability. [basis: Reg. 2-1-220.2]

3. This portable equipment, S-1, shall operate at all times in conformance with the eligibility requirements set forth in Regulation 2-1-220 for portable equipment.

4. This equipment is not to be operated within 1000 feet of the outer boundary of any K-12 school, unless the applicable requirements of the California Health and Safety Code Section 42301.6 have been met. As part of the Application 10858, these requirements have been satisfied for operation of this equipment at both 901 Emory Street and 795 Stockton Avenue in San Jose. Subsequent operation of this equipment at any other location within 1,000 feet of any K-12 school will require the submittal of an application for a revised permit to operate. [basis: Reg. 2-1-220.4]

5. This equipment shall be used exclusively for the removal of non-chlorinated volatile organic compounds associated with petroleum products from extracted soil vapor. This shall be demonstrated by onsite sampling required in condition 10 below. [basis: Health Risk Management Policy]

6. Precursor Organic Compound (POC) emissions from Source S-1 shall be abated by abatement device A-1, catalytic oxidizer during all periods of operation. Soil vapor flow rate shall not exceed 350 scfm. [basis: Reg. 8-47-301.1,2]

7. The POC abatement efficiency of abatement device A-1 shall be maintained at a minimum of 98.5% by weight for inlet POC concentrations greater than or equal to 2000 ppmv (measured as C_6). For inlet concentrations below 2000 ppmv and greater than or equal to 200 ppmv, a minimum abatement efficiency of 97% shall be maintained. For inlet concentrations below 200 ppmv, a minimum abatement efficiency of 90% shall be maintained. The minimum abatement efficiency shall be waived if outlet POC concentrations are shown to be less than 10 ppmv (measured as C_6). In no event shall benzene emissions to the atmosphere exceed 0.10 pounds per day. Annual emissions of benzene shall not exceed 6.40 pounds per year. [basis: BACT; Health Risk Management Policy]

8. **T**he minimum operating temperature of A-1 shall not be less than 600 degrees Fahrenheit.

9. To determine compliance with Condition Number 8, the catalytic oxidizer shall be equipped with continuous measuring and temperature recording instrumentation. The temperature data collected from the temperature recorder shall be maintained in a file which shall be available for District inspection for a period of at least 2 years following the date on which such data are recorded.

10. To determine compliance with Condition 7, within 24 hours after start-up of the catalytic oxidizer at any new location, the operator of this source shall:

    a. Analyze the inlet gas stream to determine the vapor flow rate and concentration of POC present.
    b. Analyze exhaust gas to determine the flow rate, and the concentration of benzene and POC present.
    c. Calculate the benzene emission rate in pounds per day based on the exhaust gas analysis and the operating exhaust flow rate. The soil vapor flow rate shall be decreased, if necessary, to demonstrate compliance with Condition 7.
    d. Calculate the POC abatement efficiency based on the inlet and exhaust gas sampling analysis. For the purpose of determining compliance with condition 7, the POC concentration shall be reported as hexane.
    e. Submit to the District's Permit Services Division the test results and emission calculations within one month from the testing date. Samples shall be analyzed according to modified EPA test methods 8015 and 8021 or their equivalent to determine the concentrations of POC and benzene.

11. Within 30 days from the completion of each treatment operation at a given location, the operator of this source shall provide the assigned Plant Engineer in the Permit Services Division with a summary showing the following information:

    a. The dates and total number of days that the equipment was at that location and the dates, and total number of days that the equipment was operated at that location.
    b. A summary of the abatement efficiency and benzene emission rate as determined and reported in the start-up sampling report required by condition 10e above.
    c. The results of any additionally performed emission test, analysis, or monitoring result logged in for the day of operation they were taken.
    d. The total throughput of contaminated soil vapor processed by S-1 at that location (indicated in cubic feet).
    e. The total emissions of benzene at that location based on the sampling results required by conditions 10 above.

    [basis: Reg. 1-523]

12. Within 30 days after the end of every calendar year, the operator of this source shall provide the assigned Plant Engineer in the Permit Services Division a year-end summary showing the following information:

    a. The location(s) at which the equipment was operated including the dates operated at each location.

b. The total throughput of contaminated soil vapor for the previous four quarters (indicated in cubic feet).

c. The total benzene emissions for the previous four quarters (indicated in pounds).

[basis Reg. 1-523]

13. The operator shall maintain a file containing all measurements, records and other data that are required to be collected pursuant to the various provisions of this conditional Permit to Operate. All measurements, records and data required to be maintained by the operator shall be retained for at least two years following the date the data is recorded. [basis Reg. 1-523]

14. Any non-compliance with these conditions shall be reported to the Compliance and Enforcement Division at the time that it is first discovered. **The submittal shall detail the corrective action taken and shall include the data showing the exceedance as well as the time of occurrence.**

by_____ date_____

Robert E. Cave
Air Quality Engineer II